

A VEHICLE ACCESSORY**Publication number:** WO0103977**Publication date:** 2001-01-18**Inventor:** LUDICK MATTHEUS ADRIAAN ALBERT (ZA); LUDICK JACOB COETZER (ZA)**Applicant:** LUDICK MATTHEUS ADRIAAN ALBERT (ZA); LUDICK JACOB COETZER (ZA)**Classification:****- international:** B60R21/13; B60R21/13; (IPC1-7): B60R21/13**- european:** B60R21/13**Application number:** WO1999IB01278 19990713**Priority number(s):** WO1999IB01278 19990713**Cited documents:** GB230640
 US391874
 FR204086
 WO98438
 DE234791
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A safety accessory (12) for a passenger vehicle (10) includes a protective structure (14) which is receivable within a passenger compartment (22) of the vehicle for defining a protected region (20) in which passengers conveyed in the vehicle are positioned in use, the protective structure having at least one roof portion (16) and a pair of opposed side portions (18). The accessory includes a fastening mean which is arranged on the protective structure for fastening it to a suitable part of the vehicle. The invention also relates to a passenger vehicle.

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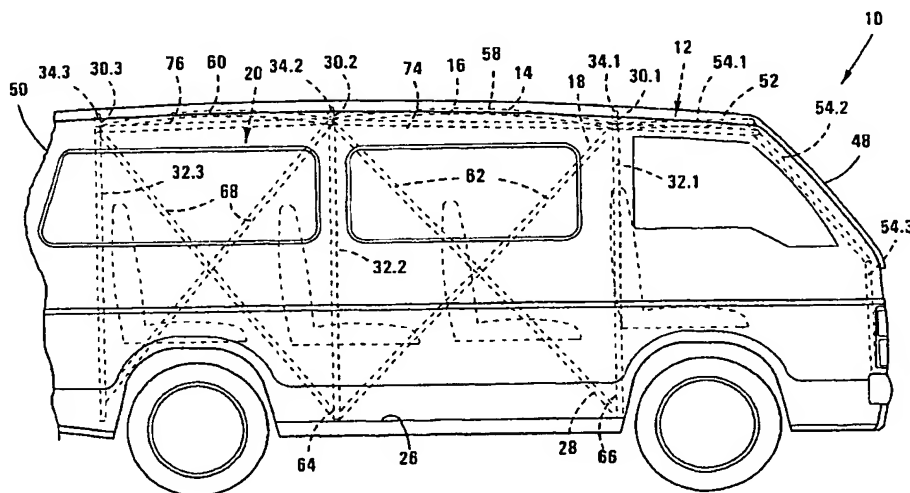
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(54) Title: **A VEHICLE ACCESSORY**



(57) Abstract: A safety accessory (12) for a passenger vehicle (10) includes a protective structure (14) which is receivable within a passenger compartment (22) of the vehicle for defining a protected region (20) in which passengers conveyed in the vehicle are positioned in use, the protective structure having at least one roof portion (16) and a pair of opposed side portions (18). The accessory includes a fastening means which is arranged on the protective structure for fastening it to a suitable part of the vehicle. The invention also relates to a passenger vehicle.

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" A VEHICLE ACCESSORY "

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THIS INVENTION relates to a vehicle accessory. More particularly, this invention relates to a safety accessory for a passenger vehicle and to a passenger vehicle.

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In this specification, the words "passenger vehicle" shall be understood to mean a vehicle which is intended to convey passengers commercially or a vehicle which is intended to convey more than five passengers.

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According to a first aspect of the invention, there is provided a safety accessory for a passenger vehicle, the safety accessory including

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a protective structure which is receivable within a passenger compartment of the vehicle for defining a protected region in which passengers conveyed in the vehicle are positioned in use, the protective structure having at least one a roof portion and a pair of opposed side

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portions; and

a fastening means which is arranged on the protective structure for fastening it to a suitable part of the vehicle.

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The accessory is intended primarily for use with mini-buses. However, the applicant believes that the invention can also be effectively applied to full size buses.

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The protective structure may include a plurality of roof portions, each having an associated pair of opposed side portions. Each roof portion and its associated pair of side portions may be interconnected to define a hoop, each hoop having an operatively horizontal tube and a pair of opposed, operatively substantially vertical

40 tubes.

40

The hoops may be positioned in a spaced, aligned fashion with at least one cross member interconnecting each consecutive pair of hoops.

45

The safety accessory may include at least one roof cross member which is fastened between each consecutive pair of horizontal

tubes and at least one side cross member which is fastened between each consecutive pair of vertical tubes.

50

An end of a roof cross member may be fastened to each end of each horizontal tube and to the upper end of each vertical tube so that the structure defines a number of pairs of aligned upper nodes. Similarly, a lower end of a side cross member may be fastened to a lower end of each vertical tube so that the structure defines a number of pairs of aligned lower nodes.

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The safety accessory may further include a cabin portion which is receivable in a driver's cabin of the vehicle for defining a protected region in which a driver of the vehicle is positioned in use, the cabin portion having at least a cabin roof portion which is connected to the structure. The cabin portion may be comprised of seamless tubes and may be connected to a pair of aligned upper nodes.

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The safety accessory may also includes an attachment arrangement which extends from the structure for attaching a roof rack.

65

Each roof portion, side portion and cross member may be

formed of an elongate steel element. The steel element may be in the
70 form of a seamless tube which is circular in cross section.

The fastening means may include a clamping device which
is configured to clamp on to the ends of the cross members and the
tubes defining the nodes so that said ends are fastened together.

75

Each clamping device may include a pair of complementary
clamping members, each of which is shaped so that, in use, when the
clamping members are clamped together, the ends of the cross
members and tubes defining the nodes are sandwiched between the
80 clamping members. Each clamping device may define a flange which
is fastenable to a chassis of the vehicle for fastening the structure to
the chassis.

The fastening means may thus include a number of upper
85 clamping devices which are engageable with the upper nodes. The
fastening means may thus also include a number of lower clamping
devices which are engageable with the lower nodes.

The invention extends to a passenger vehicle which

90 includes the accessory described above.

According to a further aspect of the invention, there is provided a passenger vehicle which includes a safety accessory for a passenger vehicle, the safety accessory including a protective structure
95 which is fastened within a passenger compartment of the vehicle, the protective structure having at least one a roof portion and a pair of opposed side portions.

The invention is now described, by way of example, with
100 reference to the accompanying drawings.

In the drawings,

Figure 1 shows a schematic side view of a vehicle which incorporates a safety accessory, in accordance with the invention, for
105 a passenger vehicle;

Figure 2 shows a schematic front view of the vehicle of Figure 1;

Figure 3 shows a schematic plan view of the vehicle of Figure 1;

Figure 4 shows a schematic side view of the safety accessory;

Figure 5 shows a schematic plan view of the safety accessory;

110 Figure 6 shows a schematic three dimensional view, from the

front, of the safety accessory;

Figure 7 shows a schematic, three dimensional view of the safety accessory, from the rear;

Figure 8 shows a plan view of an upper clamping device of the
115 safety accessory;

Figure 9 shows a schematic sectioned view of part of the clamping device of Figure 8; and

Figure 10 shows a schematic sectioned side view of part "B" of the safety accessory shown in Figure 7.

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In the drawings, reference numeral 10 generally indicates a vehicle or mini bus, in accordance with the invention, which incorporates a safety accessory 12, also in accordance with the invention.

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The safety accessory 12 includes a protective structure 14. The protective structure 14 comprises a roof portion 16 and a pair of opposed side portions 18. The protective structure 14 defines a protected region 20 and is dimensioned to be receivable within a
130 passenger compartment 22 of the vehicle 10 so that passengers (not shown) conveyed in the vehicle 10 are positioned in the protected

region 20.

The accessory 12 also includes a fastening means 24
135 which is arranged on the protective structure 14 to permit the protective
structure 14 to be fastened to a chassis 26 of the vehicle 10 when the
protective structure 14 is received in the passenger compartment 22.

The roof portion 16 and side portions 18 of the protective
140 structure 14 comprise elongate steel elements in the form of seamless
steel tubes 28.

The tubes 28 are connected together to define a number
of three aligned hoops 30, each hoop 30 having a pair of vertical tubes
145 32 and a horizontal tube 34. An upper end 36 of each pair of vertical
tubes 32.1 is connected to each end 38 of a horizontal tube 34.1. An
upper end 40 of each pair of vertical tubes 32.2 is connected to each
end 42 of a horizontal tube 34.2. Similarly, an upper end 44 of a
vertical tube 32.3 is connected to each end 46 of a horizontal tube
150 34.3.

A hoop 30.1 which comprises the vertical tubes 32.1 and

the horizontal tube 34.1 is positioned adjacent a driver's cabin 48 of the mini bus 10. A hoop 30.3 which comprises the horizontal tube 34.3 and the pair of vertical tubes 32.3 is positioned adjacent a rear 50 of the mini bus 10. A hoop 30.2 which comprises the vertical tubes 32.2 and the horizontal tube 34.2 is positioned intermediate the hoops 30.1 and 30.3.

160 The structure 14 includes a driver's cabin portion 52. The driver's cabin portion 52 includes three pairs of spaced, parallel tubes 54 which extend from the upper ends 36 of the tubes 32.1. A first pair 54.1 extends substantially horizontally from the end 36 of the tubes 32.1. A second pair 54.2 is connected to the first pair 54.1 and is angled downwardly from the first pair 54.1. A third pair 54.3 is connected between the second pair 54.2 and the chassis 26. A number of cross-members 56 are connected between the tubes 54 to brace the tubes 54.

170 A first pair of roof cross-members 58 are connected between the horizontal tubes 34.1, 34.2. A cross-member 58 extends diagonally from each end 38 of the horizontal tube 34.1 to each diagonally opposed end 42 of the horizontal tube 34.2.

A second pair of roof cross-members 60 is connected
175 between the horizontal tubes 34.2., 34.3. A roof cross-member 60
extends from each end 42 of the horizontal tube 34.2 to each end 46
of the horizontal tube 34.3.

A pair of side cross-members 62 is connected between one
180 of the vertical tubes 32.1 and one of the vertical tubes 32.2. These
vertical tubes 32.1, 32.2 are positioned on the same side of the mini
bus 10. Thus, provision is made for a door of the mini bus 10. A side
cross-member 62 extends from the upper end 36 of the vertical tube
32.1 to a lower end 64 of the vertical tube 32.2. A side cross-member
185 62 extends from the upper end 40 of the vertical tube 32.2 to a lower
end 66 of the vertical tube 32.1.

A pair of side cross-members 68 is connected between the
vertical tube 32.2 and the vertical tube 32.3 on one side of the mini bus
190 10. A further pair of side cross-members 70 is connected between a
vertical tube 32.2 and a vertical tube 32.3. The side cross-members
68, 70 are connected to their respective vertical tubes 32 in the same
manner as are the side cross-members 62.

A second pair of roof cross-members 60 is connected
175 between the horizontal tubes 34.2., 34.3. A roof cross-member 60
extends from each end 42 of the horizontal tube 34.2 to each end 46
of the horizontal tube 34.3.

A pair of side cross-members 62 is connected between one
180 of the vertical tubes 32.1 and one of the vertical tubes 32.2. These
vertical tubes 32.1, 32.2 are positioned on the same side of the mini
bus 10. Thus, provision is made for a door of the mini bus 10. A side
cross-member 62 extends from the upper end 36 of the vertical tube
32.1 to a lower end 64 of the vertical tube 32.2. A side cross-member
185 62 extends from the upper end 40 of the vertical tube 32.2 to a lower
end 66 of the vertical tube 32.1.

A pair of side cross-members 68 is connected between the
vertical tube 32.2 and the vertical tube 32.3 on one side of the mini bus
190 10. A further pair of side cross-members 70 is connected between a
vertical tube 32.2 and a vertical tube 32.3. The side cross-members
68, 70 are connected to their respective vertical tubes 32 in the same
manner as are the side cross-members 62.

195 A pair of rear cross-members 72 are connected between
the pair of vertical tubes 32.3.

 An upper cross-member 74 is connected between each
upper end 36 of the vertical tubes 32.1 and each upper end 40 of the
200 vertical tubes 32.2. An upper cross-member 76 is connected between
each pair of aligned upper ends 36, 40 of the vertical tubes 32.2., 32.3.

 The cross-members are also in the form of seamless steel
tubes 28.

205

 It will be appreciated that the structure 14 defines three
pairs of upper nodes 78 and three pairs of lower nodes 80. For the
purposes of brevity, the fastening means 24 is described below with
reference to one of the upper nodes 78 generally indicated at "A" in
210 Figure 7 and one of the lower nodes 80, generally indicated at "B" also
in Figure 7. In this specification, reference to the upper nodes 78 shall
be understood to mean reference to the node generally indicated at "A".
Further, any reference to the node 80 shall be understood to mean
reference to the node generally indicated at "B" in Figure 7.

215

It will readily appreciated that by merely altering the shape of the fastening means 24, it will be possible to obtain a configuration suitable for fastening any of the nodes 78, 80, together. It follows that the reference numeral 28 in Figures 8 to 10 is used so that it is understood to be interchangeable with any of the tubes and cross members of the structure 14.

In Figure 8, a schematic plan view of a clamping device 82 is shown. The clamping device 82 includes an upper shell 84 and lower shell 86 (Figure 9). The shells 84, 86 each define six clamping formations 88. Further, the shells 84, 86 are shaped so that a tube 28 can be clamped between any pair of corresponding clamping formations 88, as is shown in Figure 9.

Each upper clamping formation 88.1 has a pair of aligned openings 90 defined therein. A threaded nut 92 is fast with each clamping formation 88 about each opening 90. Each lower clamping formation 88.2 also has a pair of openings 94 defined therein. An opening 94 is aligned with each opening 90 when the shells 84, 86 are clamped together. That portion of a tube 28 which is sandwiched between the clamping formations 88 also has openings defined therein

so that a bolt 96 can pass through each opening 94, the tube 28 and the opening 90 to be threadedly received in the nut 92. It will be appreciated that, by screwing each bolt 96 into its associated nut 92, 240 the shells 84, 86 are drawn together to clamp the tube 28 therebetween. A pair of bushes 98 are positioned in an end of each tube 28. A bush 98 is aligned with each pair of aligned openings 94, 90. Each bush 98 is dimensioned to inhibit buckling of the tube 28.

245 Each bolt 96 is of the type having a snap-off head 100. The snap-off head 100 is designed so that, at a desired torque, the head 100 parts from the bolt 96. This inhibits tampering with the bolts 96 and also indicates whether or not the bolts 96 have been correctly tightened.

250

The clamping device 82 includes twelve of the devices 82. As set out above, by simply modifying the clamping device 82, it is possible to obtain a configuration which can be used with any of the upper nodes 78.

255

In Figure 10, there is shown a schematic, side-sectioned view of the node 80. A further clamping device 102 is provided to

fasten tubes 28 to the chassis 26.

260 As with the clamping device 82, the clamping device 102 includes a pair of shells, one of which is indicated at 104. With reference to Figures 8 and 9, like reference numerals refer to like parts, unless otherwise specified.

265 The clamping device 103 includes a flange 106. The flange 106 is divided into two parts, one part being formed integrally with each shell 104.

270 Once the shells 104 have been clamped together in the manner described above with reference to Figures 8 and 9, with the tubes 28 locked in the position shown in Figure 10, the flange 106 is bolted to the chassis 26. For this purpose, a threaded formation 107 is defined on an inner surface 108 of the chassis 26.

275 In order to further secure a vertical tube 28 to the chassis 26, an insert 110 is threaded into a lower end 112 of the vertical tube 28. The lower end 112 has a number of openings (not shown) defined therein so that, once the insert 110 has been screwed into position, the

insert 110 can be tack-welded to the tube 28 to inhibit further rotational
280 movement of the insert 110. The insert 110 defines a threaded passage
114 which extends through the insert 110.

The chassis 26 comprises a number of tubular box
elements, one of which is indicated at 116. The box element 116
285 comprises a pair of opposed side walls 118 and a pair of opposed upper
and lower walls 120, 122. The upper wall 120 and the lower wall 122
have a pair of aligned openings 124 defined therein. The openings 124
are aligned with the threaded passage 114. A threaded bolt of the
snap-off type, similar to the bolt 96 is received through the openings
290 124 and is threaded into the passage 114. The bolt is then tightened
until the head of the bolt parts from the shank thereof. It will be
appreciated that this will further secure the vertical tube 28 to the
chassis 26, in a tamper-proof fashion.

295 A plate 126 is secured to the lower wall 122 of the
element 116. The plate 126 and the lower wall 122 have four pairs of
aligned openings 128 defined therein. A threaded formation 130 is
defined on an inner side 130 of the lower wall 122, about each opening
128. A bolt (not shown) is received through each pair of aligned

300 openings 128 to threadedly engage each formation 130.

The plate 126 has a central opening 132 defined therein. The opening 132 is aligned with the openings 124. A bush 134 is received in the element 116 to be aligned with the openings 124. Thus,
305 the shank of the snap-off bolt is received through the opening 132, the openings 124 and the bush 134.

The applicant believes that the invention provides a safety accessory 12 for use with a mini bus 10 which will substantially reduce
310 the death rate of mini bus drivers and passengers. In the majority of mini bus accidents, rolling of the mini bus results in destruction of the passenger compartment. The protective structure 14 supports the passenger compartment in the manner described above. This will assist in maintaining a protective region within the passenger compartment so
315 that the passengers are not ejected from the vehicle or killed or injured by a collapsing roof of the mini bus 10.

CLAIMS:

- 320 1. A safety accessory for a passenger vehicle, the safety
accessory including
 a protective structure which is receivable within a passenger
compartment of the vehicle for defining a protected region in which
passengers conveyed in the vehicle are positioned in use, the protective
325 structure having at least one a roof portion and a pair of opposed side
portions; and
 a fastening means which is arranged on the protective structure
for fastening it to a suitable part of the vehicle.
- 330 2. The safety accessory as claimed in Claim 1, in which the
protective structure includes a plurality of roof portions, each having an
associated pair of opposed side portions.
3. The safety accessory as claimed in Claim 2, in which each
335 roof portion and its associated pair of side portions are interconnected
to define a hoop, each hoop having an operatively horizontal tube and
a pair of opposed, operatively substantially vertical tubes.
4. The safety accessory as claimed in Claim 3, in which the

340 hoops are positioned in a spaced, aligned fashion with at least one cross member interconnecting each consecutive pair of hoops.

5. The safety accessory as claimed in Claim 3 or Claim 4, which includes at least one roof cross member which is fastened
345 between each consecutive pair of horizontal tubes and at least one side cross member which is fastened between each consecutive pair of vertical tubes.

6. The safety accessory as claimed in Claim 5, in which an
350 end of a roof cross member is fastened to each end of each horizontal tube and to the upper end of each vertical tube so that the structure defines a number of pairs of aligned upper nodes.

7. The safety accessory as claimed in Claim 6, in which a
355 lower end of a side cross member is fastened to a lower end of each vertical tube so that the structure defines a number of pairs of aligned lower nodes.

8. The safety accessory as claimed in Claim 1, which ~~includes~~
360 a cabin portion which is receivable in a driver's cabin of the vehicle for

defining a protected region in which a driver of the vehicle is positioned in use, the cabin portion having at least a cabin roof portion which is connected to the structure.

365 9. The safety accessory as claimed in Claim 1, which includes an attachment arrangement which extends from the structure for attaching a roof rack.

370 10. The safety accessory as claimed in Claim 4, in which each roof portion, side portion and cross member is formed of an elongate steel element.

375 11. The safety accessory as claimed in Claim 11, in which the steel element is in the form of a seamless tube which is circular in cross section.

380 12. The safety accessory as claimed in Claim 7, in which the fastening means includes a clamping device which is configured to clamp on to the ends of the cross members and the tubes defining the nodes so that said ends are fastened together.

13. The safety accessory as claimed in Claim 12, in which each clamping device includes a pair of complementary clamping members, each of which is shaped so that, in use, when the clamping
385 members are clamped together, the ends of the cross members and tubes defining the nodes are sandwiched between the clamping members.

14. The safety accessory as claimed in Claim 12, in which each
390 clamping device defines a flange which is fastenable to a chassis of the vehicle for fastening the structure to the chassis.

15. A passenger vehicle which includes an accessory as claimed in any one of Claims 1 to 16.

395

16. A passenger vehicle which includes a safety accessory for a passenger vehicle, the safety accessory including a protective structure which is fastened within a passenger compartment of the vehicle, the protective structure having at least one a roof portion and
400 a pair of opposed side portions.

17. A safety accessory for a passenger vehicle, substantially

as herein described with reference to the accompanying drawings.

- 405 18. A passenger vehicle, substantially as herein described with
reference to the accompanying drawings.

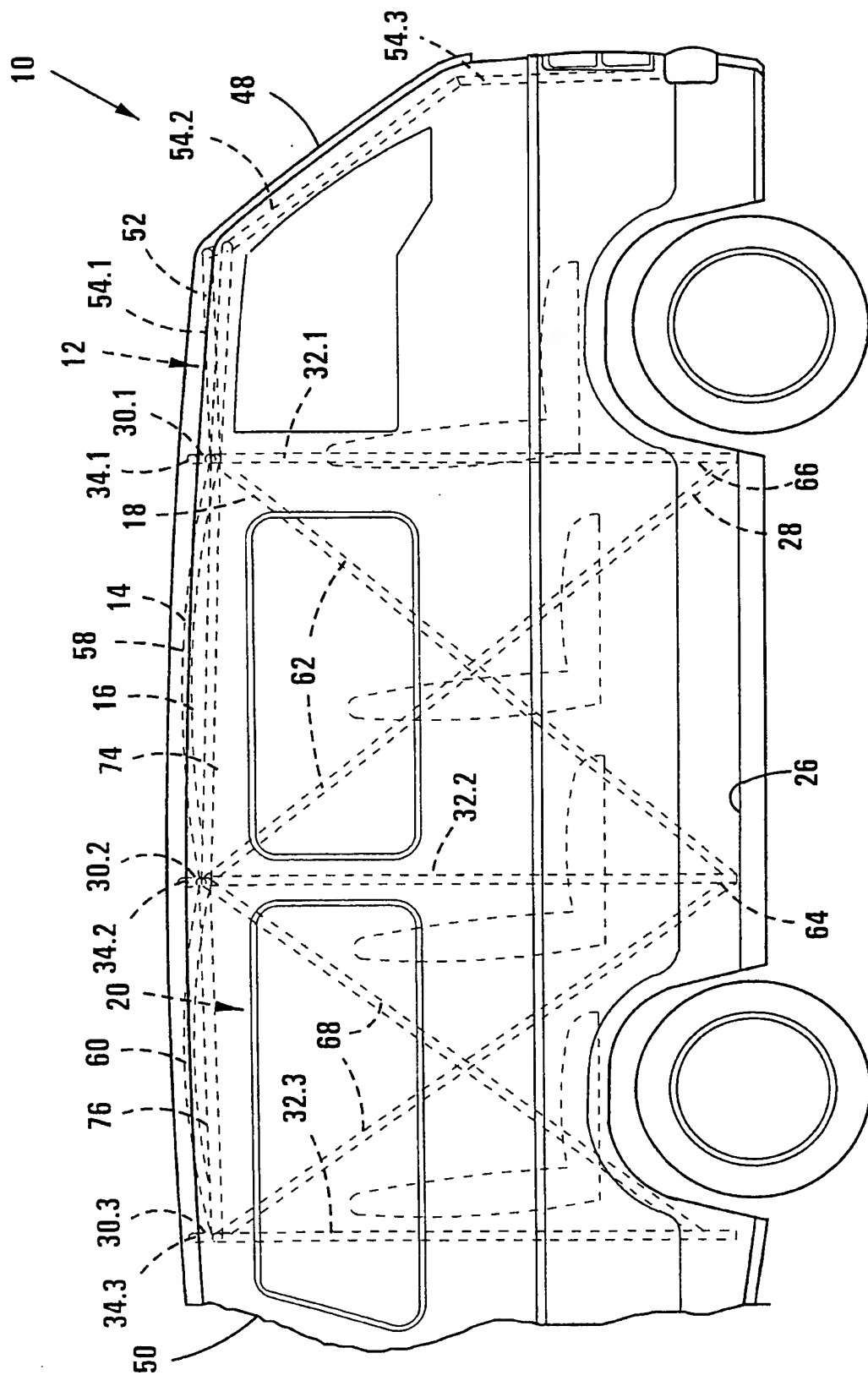


FIG 1

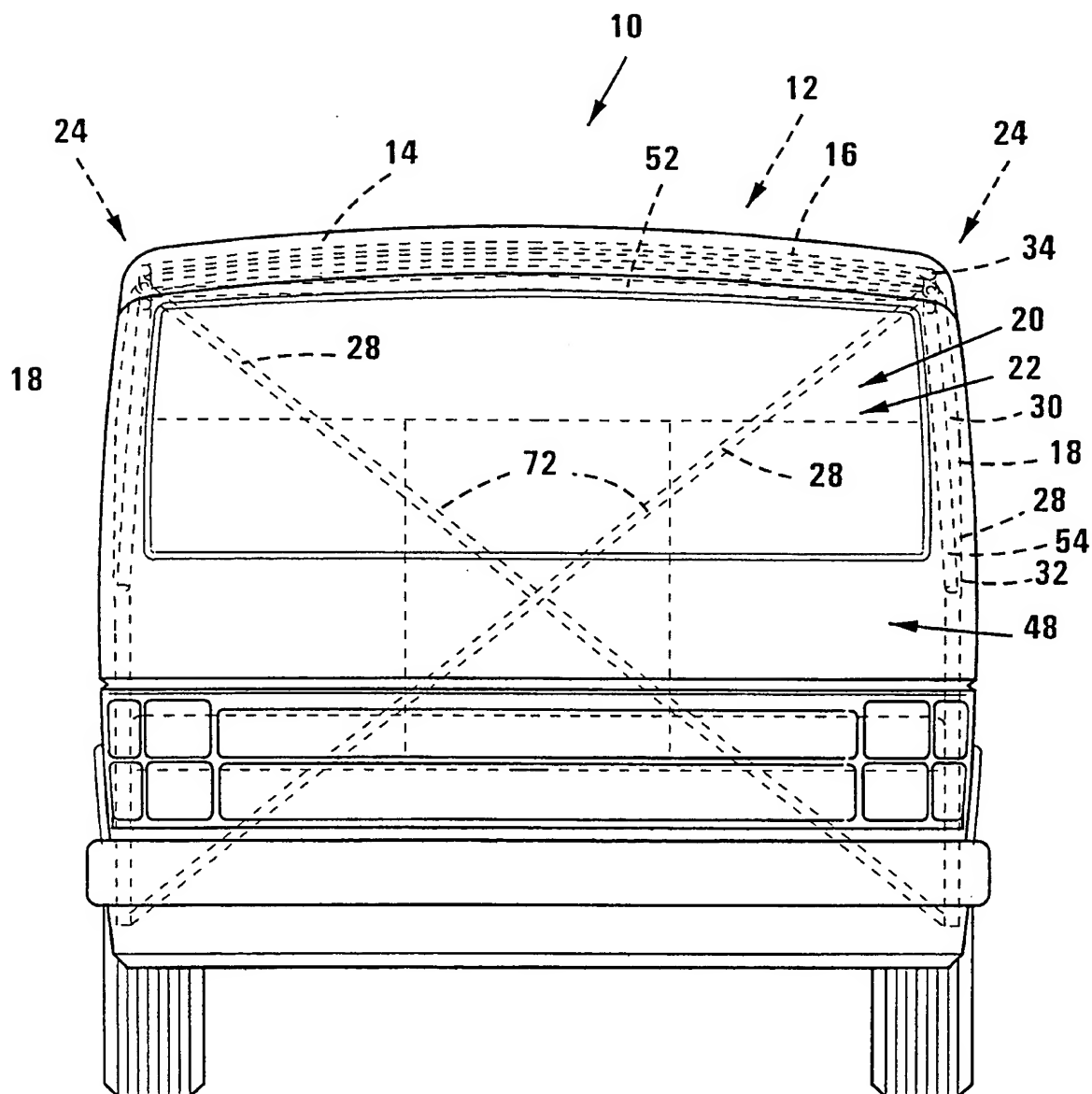


FIG 2

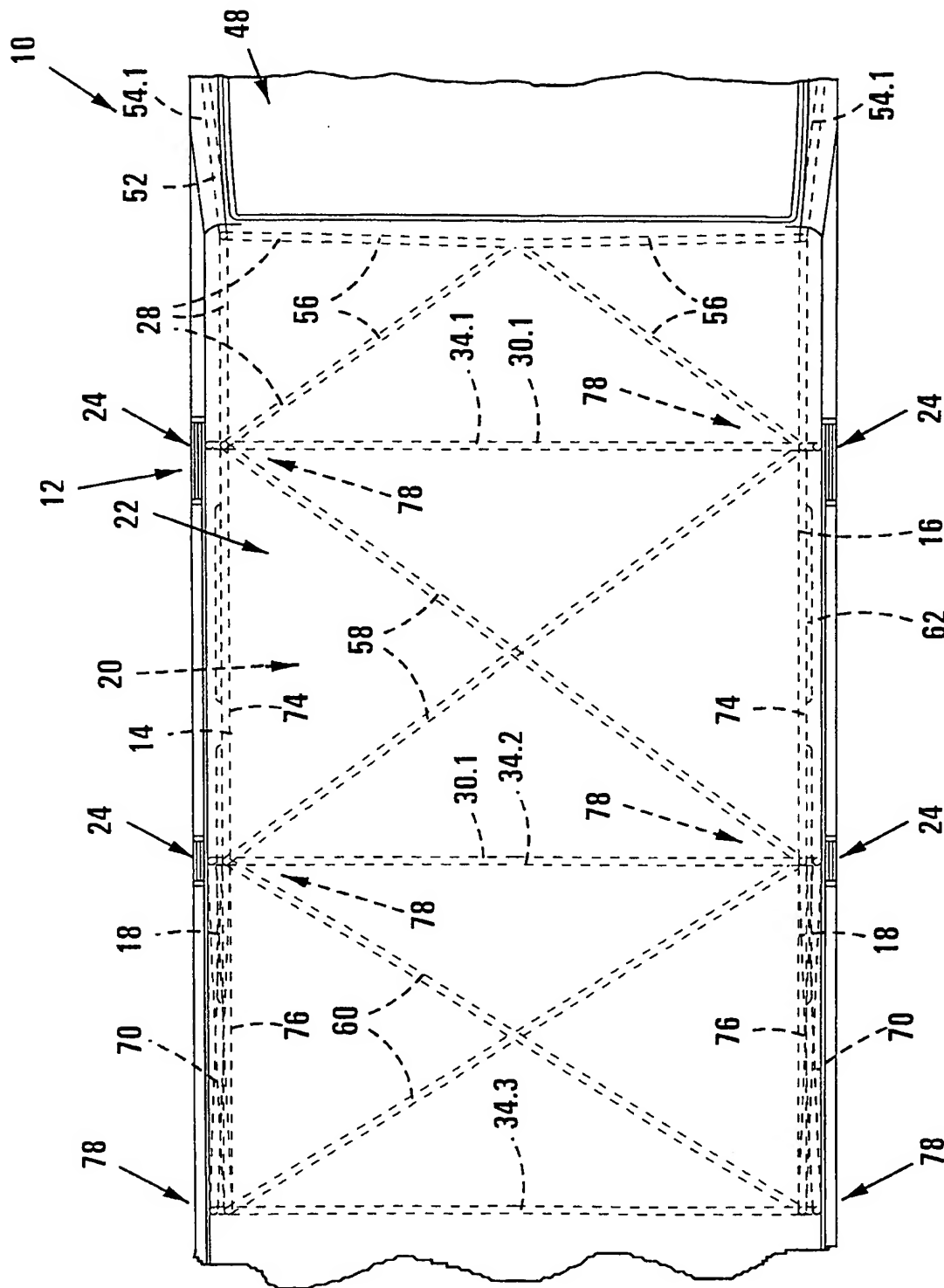


FIG 3

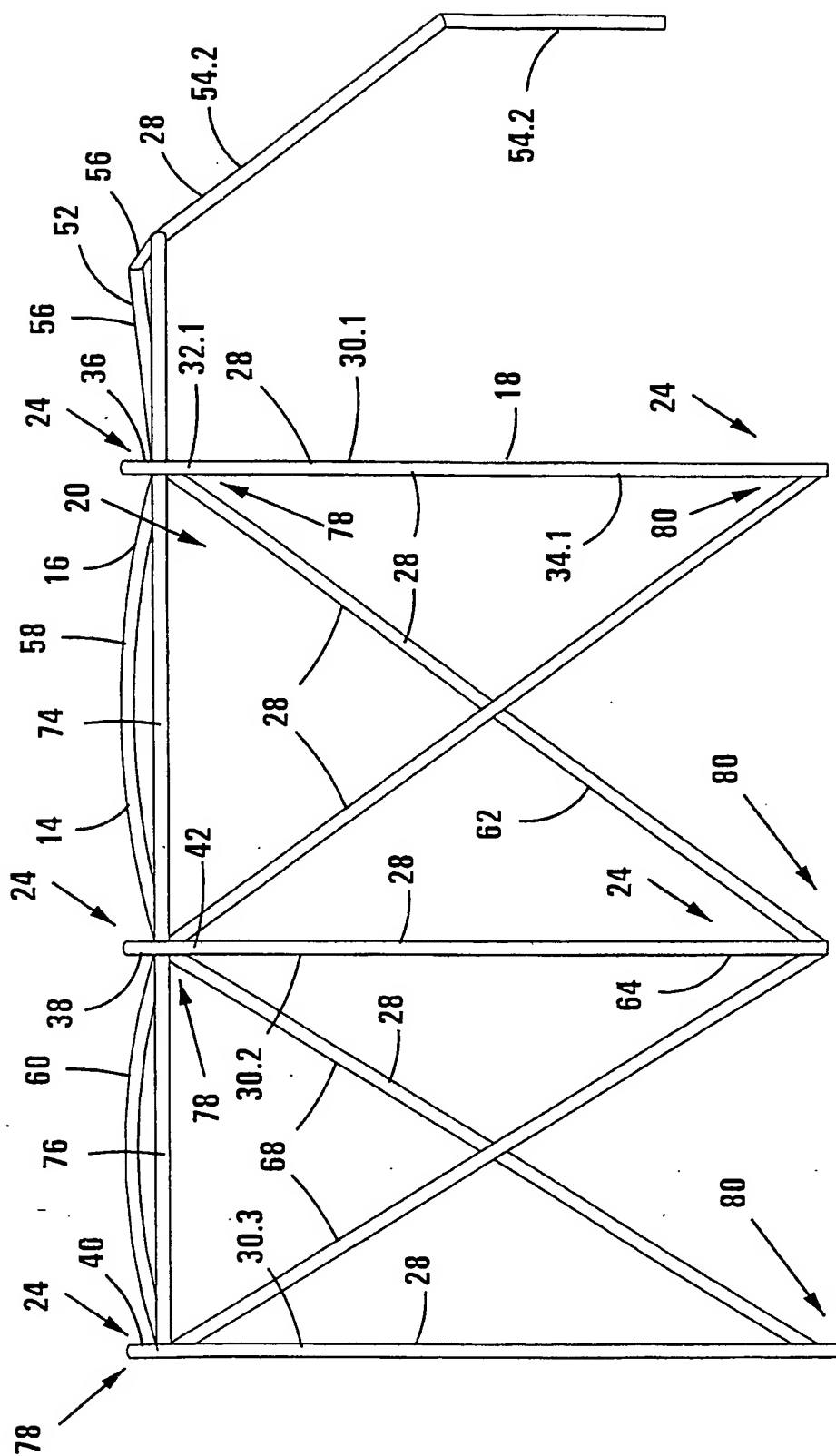


FIG 4

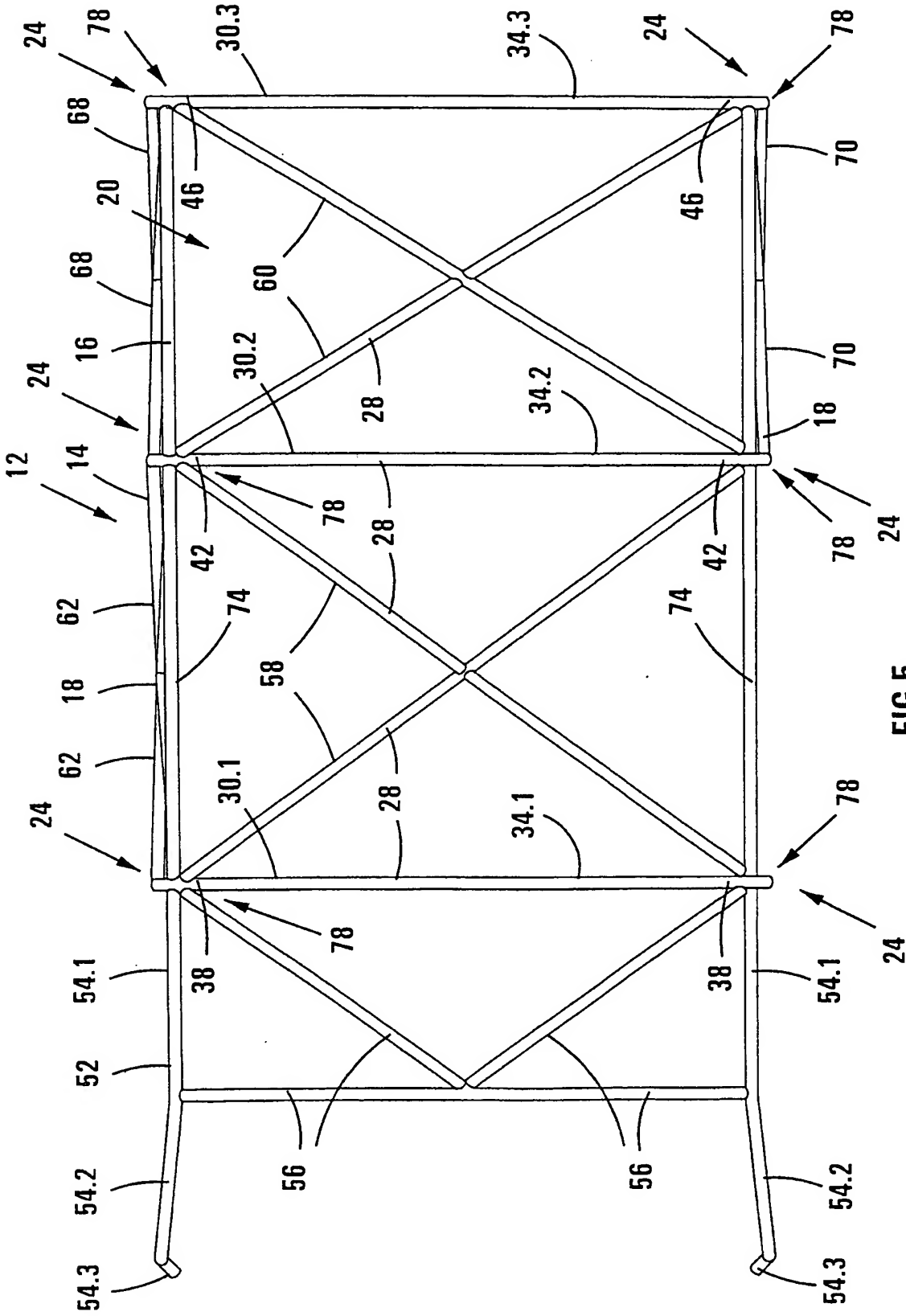


FIG 5

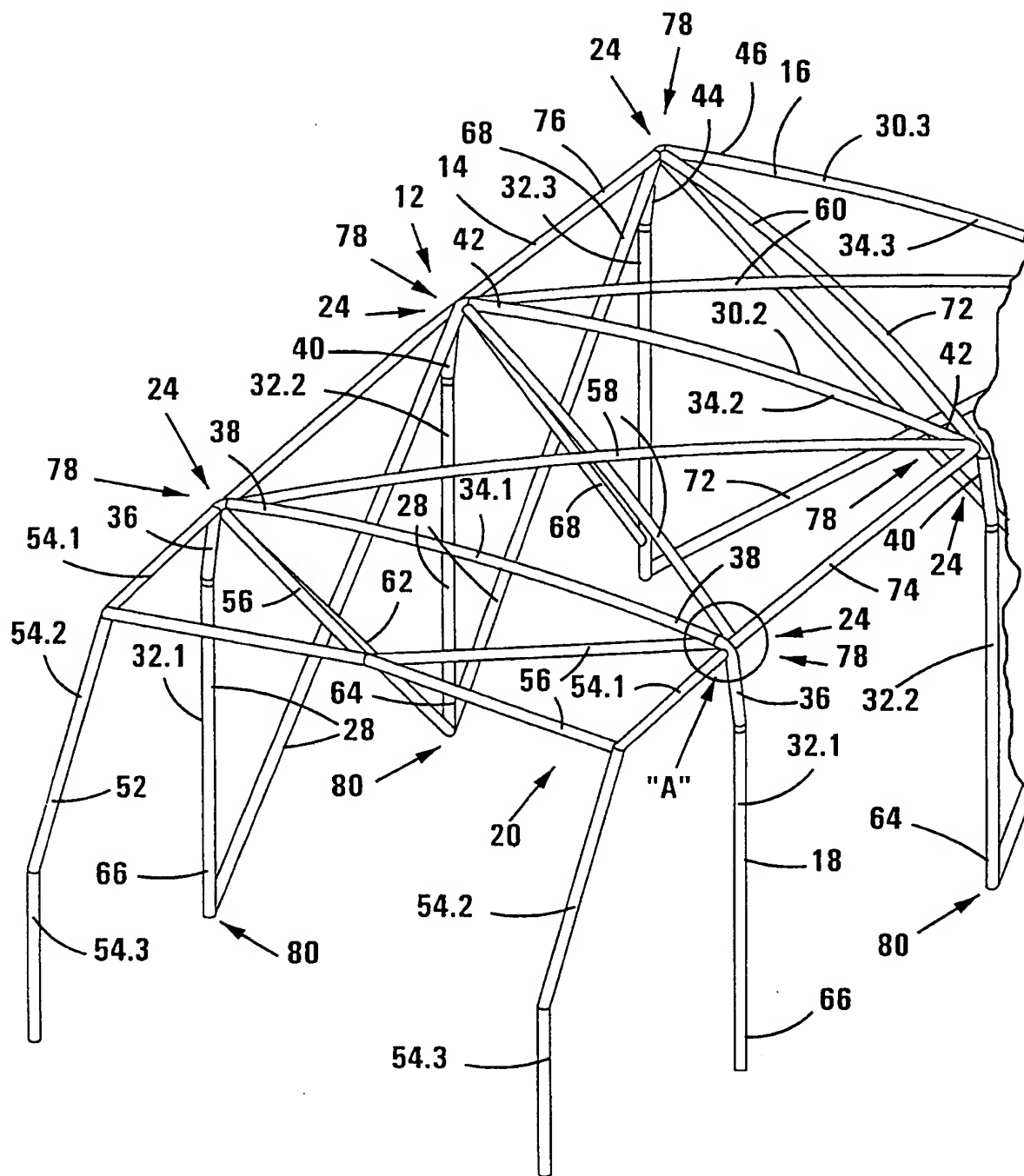


FIG 6

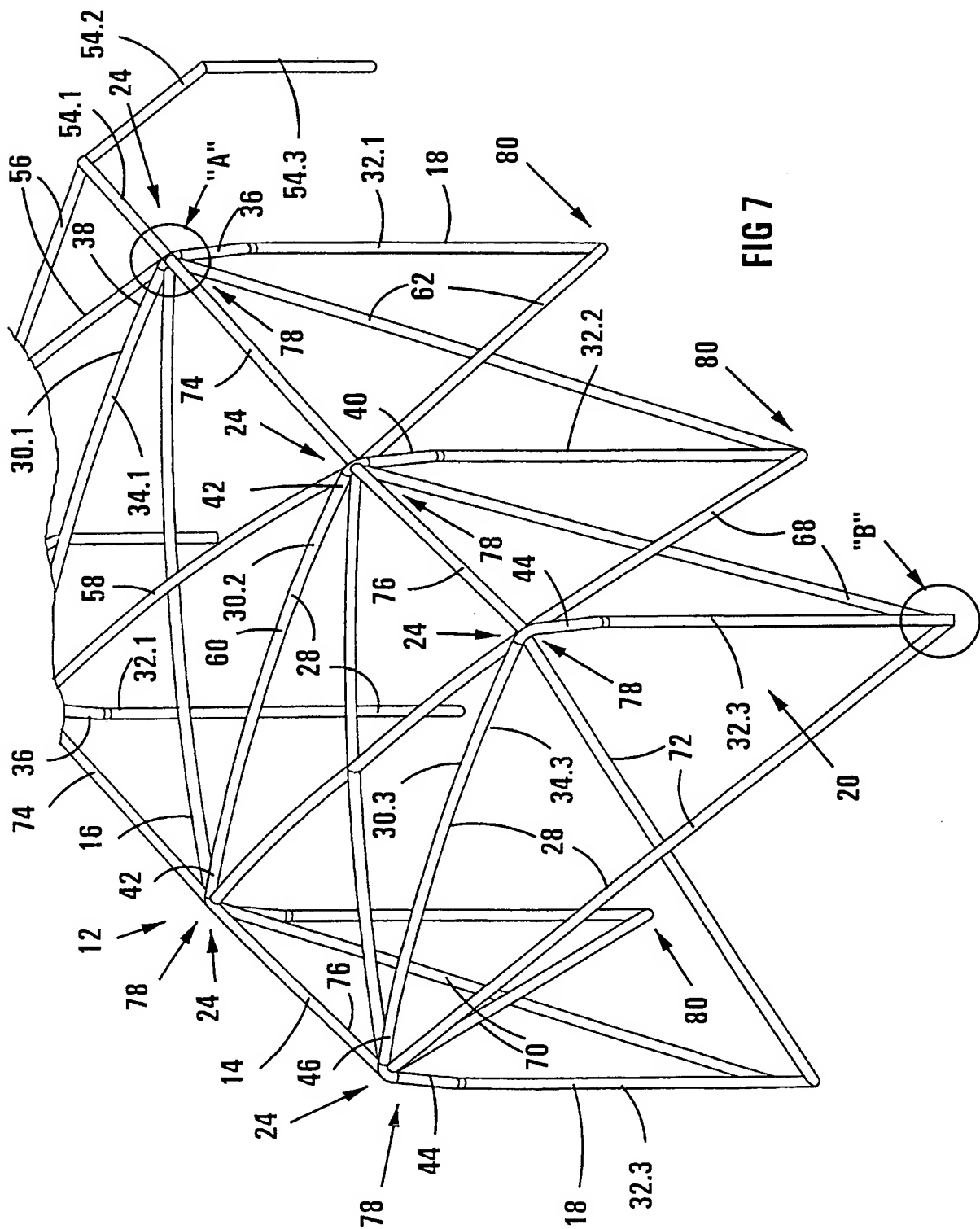
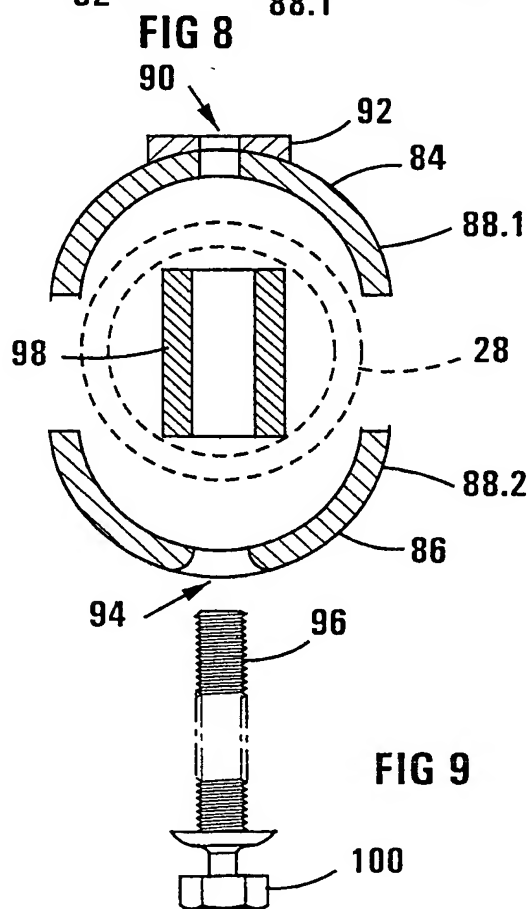
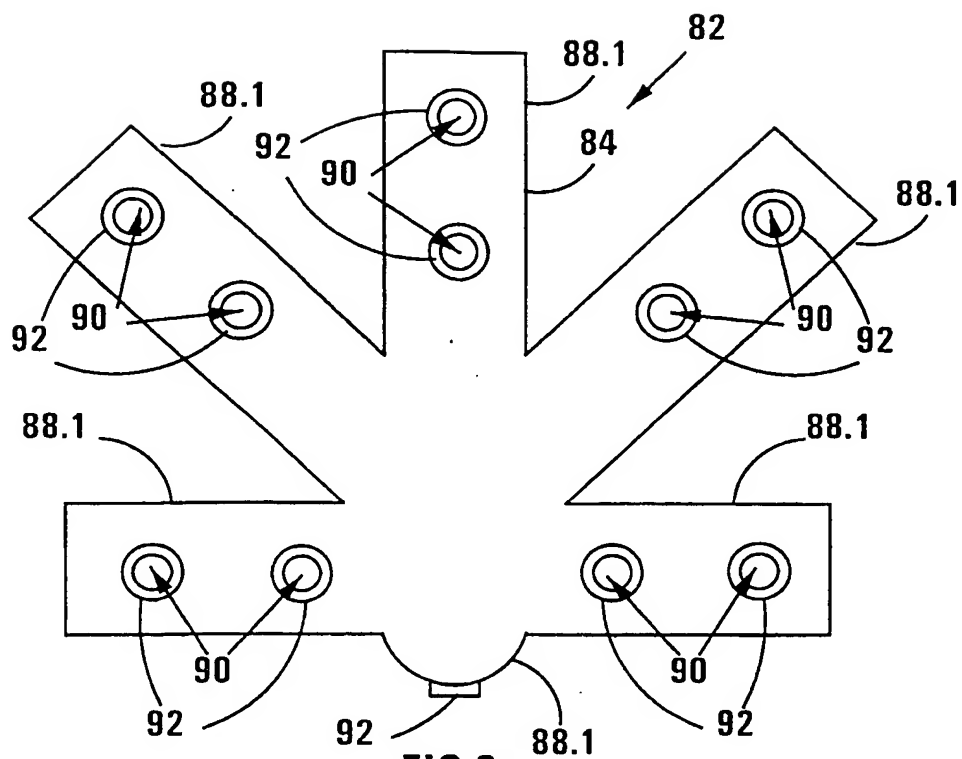
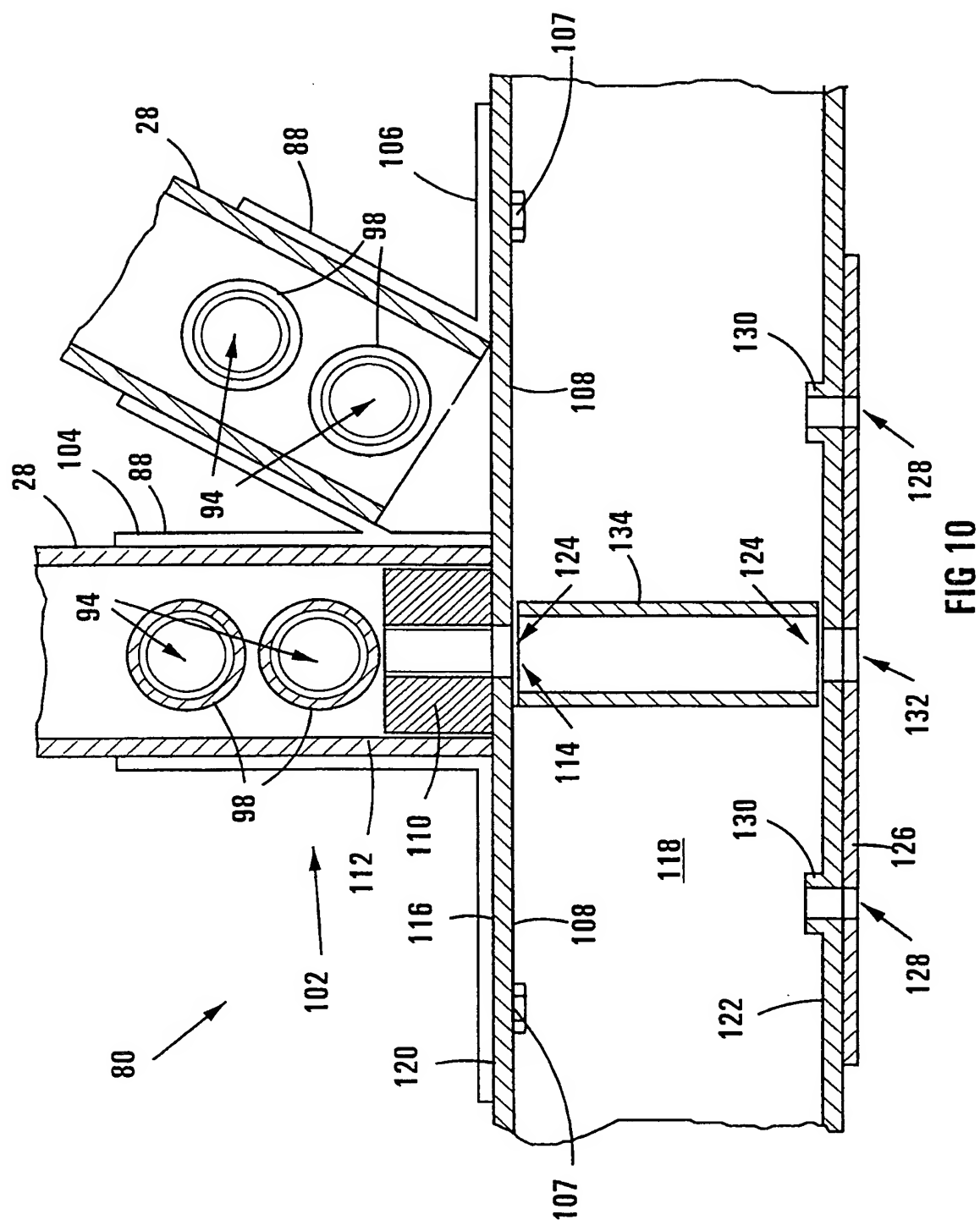


FIG 7





INTERNATIONAL SEARCH REPORT

Int. l. Application No
PCT/IB 99/01278

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B60R21/13

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 306 408 A (SAFETY DEVICES LTD) 7 May 1997 (1997-05-07) page 1, line 3 -page 3, line 4 page 3, line 21 - line 23 figures	1-7, 10, 11, 15-18
A	—	8, 12-14
X	US 3 918 740 A (NOTESTINE RICHARD L) 11 November 1975 (1975-11-11) column 1, line 36 - line 54 column 2, line 6 - line 10 column 2, line 18 -column 3, line 6 figures	1-4, 10, 11, 15-18
A	—	5
X	FR 2 040 866 A (WYCHODCEW VLADIMIR) 22 January 1971 (1971-01-22) the whole document	1-4, 10, 11, 15-18
A	—	8
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

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INTERNATIONAL SEARCH REPORT

Int. .onal Application No
PCT/IB 99/01278

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 43854 A (GYLLENSPETZ PER ;VOLVO AB (SE)) 8 October 1998 (1998-10-08) page 3, line 3 - line 23 page 4, line 31 -page 5, line 16 page 7, line 4 - line 10 figures 1,4	1,15-18
X	DE 23 47 917 A (GOERKE HANS JOACHIM) 3 April 1975 (1975-04-03) page 1, paragraph 1 -page 2, paragraph 4 page 3, paragraph 1 - paragraph 2 page 4, paragraph 3 - paragraph 4 figure	1-5,10, 11,15-18
A	DE 87 14 471 U (WILHELM KARMANN GMBH) 10 December 1987 (1987-12-10) page 2, last paragraph -page 3, last paragraph; figures	1,9,16

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IB 99/01278

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2306408	A	07-05-1997	NONE	
US 3918740	A	11-11-1975	NONE	
FR 2040866	A	22-01-1971	NONE	
WO 9843854	A	08-10-1998	SE 508854 C EP 0969990 A SE 9701151 A	09-11-1998 12-01-2000 28-09-1998
DE 2347917	A	03-04-1975	DE 2327349 A	19-12-1974
DE 8714471	U	10-12-1987	NONE	